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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,597	02/28/2002	Thomas W. Lanzatella	1557.002US1	1885

7590 10/22/2004

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EXAMINER

TRUONG, CAM Y T

ART UNIT	PAPER NUMBER
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2162

DATE MAILED: 10/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/086,597

Applicant(s)

LANZATELLA ET AL.

Examiner

Cam Y T Truong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 8-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/27/2003
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

1. Claims 1-20 are pending in this Office Action.

Election/Restrictions

2. Applicant's election without traverse of group I (claims 1-7) in the reply filed on 8/2/2004 is acknowledged.

Specification

Content of Specification

- (a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.
- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.
- (d) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.

Or alternatively, Reference to a "Microfiche Appendix": See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.

- (e) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:

- (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."
 - (2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."
- (f) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.
- (g) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.
- (h) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.

- (i) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).
- (j) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).
- (k) Sequence Listing. See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

Title

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Cross-References to Related Applications

4. Applicant should fill out the serial numbers of co-pending applications on page 1, lines 22-24.
5. Minor informalities: Typographical error is shown in the phrase "filed November 29, 2001 filed November 29, 2001" on page 1, lines 24-25. The

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phrase "filed November 29, 2001 filed November 29, 2001" should be written as "filed November 29, 2001".

Appropriate correction is required.

6. Examiner considered the following co-pending, commonly assigned U.S. patent applications:

"Methods, Functional Data, and Systems to Represent a Storage Environment," attorney docket no. 1557.001US1, Ser. No. 09/997,602 filed Nov. 29, 2001;

"Methods, Systems, and Apparatus to Interface with Storage Objects," attorney docket no. 1557.0003US1, Ser. No. 09/997,612 filed Nov. 29, 2001;

"Systems, Methods, and Apparatus for Creating Stable Disk Images" attorney docket no. 1557.004US1, Ser. No. 10/087230 filed Feb. 28, 2002 and

"Methods and Systems to Interface Storage Objects," attorney docket no. 1557.005US1, Ser. No. 09/997350 filed Nov. 29, 2001, each of which is herein incorporated by reference in its entirety.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-3, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mutalik et al (or hereinafter "Mutalik") (US 6360330) in view of Ohran (US 6085298).

As to claim 1, Mutalik teaches a method to backup data from a storage environment (fig. 1, col. 2, lines 42-45), comprising:

"receiving storage extents associated with a frozen image representing the data as it resides in the storage environment" as the stored data in storage mirrors 16(s) of mass storage subsystem 12 is an image. This image is not a frozen image. A control circuitry receives the list of disk extents and associated physical disk storage devices from the backup server 13. The physical disk storage devices comprise the respective storage mirrors 16(s), which stores the data or file. Thus, when the list of disk extents is associated with physical disk storage, the list disk extents are associated with the stored data or file in storage mirrors 16(s) too. The mass storage subsystem is represented as storage environment (fig. 2D, col. 10, lines 61-67; col. 8, lines 20-33);

"issuing operating system input/output (I/O) operations to one or more storage devices housing the frozen image using the storage extents to acquire

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the data" as the stored data in disk extents of storage mirrors 16(s) is image.

This image is not frozen image. The backup server, which makes use of operating system-independent file handling call, sends each file to be backed up, a retrieval request including the list of disk extents and associated physical disk storage devices to the control circuitry. After receiving the list of disk extents from server 13, the control circuitry 15 retrieves or acquires the data from storage mirrors 16(s). The above information implies that storage mirrors 16(s) is issued each retrieval request for each file to be backed up indirectly from the server 13 via the control circuitry 15. Each retrieval request of each file to be backed up such as a read operation is represented as one input/output operation. The storage mirrors 16(s) is represented as one storage device (fig. 2D, col. 10, lines 60-67; col. 8, lines 27-35; col. 14, lines 33-35); and

"issuing one or more of the operating system I/O operations to a storage media to write the data to the storage media" as the server 13, which makes use of operating system-independent file handling call, transfers the retrieved data from the mass storage subsystem 12 the backup data store 14. This backup data store 14 stores the data on the backup medium. The above information indicates that backup medium is received the transferring retrieved data indirectly from the server 13 to store or write the retrieved data to the backup medium. The backup medium is represented as a storage media. The transferring the retrieved data such as a write operation is represented as one I/O operation (fig. 2D, col. 11, lines 1-7; col. 14, lines 33-35).

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Mutalik does not explicitly teach the claimed limitation "frozen image".

Ohran teaches since the data is preserved by a snapshot at time t1, the data will be available for transferring to the backup storage device even though new data is written to the mass storage device after time t1 (col. 11, lines 38-42). Further, applicant defined that the term "frozen image" as the data is stabilized at a point in time by using snapshot (page 13, lines 24-27; page 10, lines 3-5). Thus, the preserved data by a snapshot at time t1, which is a stable version of the data, is represented as a frozen image of the data.

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Ohran's teaching of preserving the data by a snapshot at time T1 for transferring to the backup storage device to Mutalik's system in order to prevent changes to the data during the backup process (col. 3, line 50) and further to preserve the original data of the primary mass storage device during the backup process.

As to claim 2, Mutalik teaches "wherein in issuing the operating system I/O operations, the operations are issued from a first computing device which is ~~separate from second computing device~~" as the server 13 sends each file to be backed up, a retrieval request including the list of disk extents to control circuitry 15 of mass storage subsystem. Also, the server 13 transfers the retrieved data to the backup data store 14, which stores or writes the retrieved data in the backup medium. Each retrieval request and the transferring the retrieved data are represented as I/O operations. The above information shows that the

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computer server 13 has issued I/O operations. The computer server 13 is presented as a first computing device. The host 11 is represented as a second computing device (col. 10, lines 60-67; col. 11, line 1-11; col. 14, lines 33-35) "wherein the frozen image and storage extents are created" as the stored data in disk extents of storage mirrors 16(s) is image. This image is not frozen image. The above information shows that disk extents are created in storage mirrors 16(s) to store image (col. 8, lines 27-25).

Mutalik does not explicitly teach the claimed limitation " wherein the frozen image". Ohran teaches since the data is preserved by a snapshot at time t1, the data will be available for transferring to the backup storage device even though new data is written to the mass storage device after time t1 (col. 11, lines 36-42). Applicant defines that data is stabilized at a point in time, thereby creating a frozen image of the data (page 13, lines 24-27). Thus, the preserved data by a snapshot at time t1, which is a stable version of the data, is represented as a frozen image of the data.

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Ohran's teaching of preserving the data by a snapshot at time T1 for transferring to the backup storage device to Mutalik's system in order to prevent changes to the data during the backup process (col. 3, line 50) and further to preserve the original data of the primary mass storage device during the backup process.

As to claim 3, Mutalik does not explicitly teaches the claimed limitation “issuing a configuration identification operation to determine if a number of the storage extents have been altered within the storage environment after the frozen image is created and before issuing the operating system I/O operations; and receiving only the number of storage extents which were altered, if at all, before proceeding to issue the operating system I/O operations”. However, Mutalik teaches after receiving the list of disk extents from server 13, the control circuitry 15 retrieves the data from storage mirrors 16(s) (fig. 2D, col. 10, lines 60-67). Ohran teaches the map that was used to track, which storage locations had data written therein between time T0 and time T1 to identify the data that should be transferred to the backup storage device. Note that only those data blocks that were changed between time T0 and T1 are transferred. Those data blocks contain changed records at a particular point in time. The above information indicates that the system has included a configuration identification operation by using the map to determine a number of data blocks have been changed after records in those blocks have changed in particular point in time. In this case, data blocks are presented as storage extents (figs. 2&7A, col. 11, lines 41-46; col. 12, lines 17-18).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Ohran’s teaching of using the map to determine which data blocks have been changed after creating records in particular point in time and only transferring changed data blocks into Mutalik’s system in order to synchronize or maintain data blocks between storage device

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and backup server and further to reduce the amount of data needed to create a backup copy (col. 5, line 15).

As to claim 5, Mutalik teaches "wherein in receiving the storage extents, the data is at least one of a file, a set of files, a file system, a set of file systems, a volume, and a set of volumes" as the stored data in storage mirrors 16(s) is a file (fig. 2D, col. 8, lines 34-35; col. 10, lines 65-67).

As to claim 6, Mutalik teaches "wherein in issuing one or more of the operating system I/O operations to the storage media to write the data to the storage media, the storage media is a non-volatile storage media" as after receiving the retrieved data from the mass storage subsystem 12, the server 13 transfers the retrieved data to the backup data store 14, which stores the data on the backup medium such as cartridges. The backup medium is represented as a non-volatile storage media (col. 11, lines 1-7; col. 4, lines 62-67).

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mutalik et al (or hereinafter "Mutalik") (US 6360330) in view of Dunham et al (or hereinafter "Dunham") (US 6714952).

As to claim 4, Mutalik teaches the claimed limitation "wherein in receiving the storage extents" as (fig. 2D, col. 10, lines 63-65).

Mutalik does not explicitly teach the claimed limitation "the storage environment is interconnected by a storage area network (SAN)".

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Dunham teaches the backup restore/server 30 is connected to SAN (fig. 1, col. 4, lines 7-8).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Dunham's teaching of connecting the backup restore/server 30 to SAN to Mutalik's system in order to enable direct high speed connections between various storage elements and host systems (col. 4, lines 65-67; col. 5, line 1) and further provide high bandwidth and high throughput storage for client computers such as file servers, web servers and end user computers.

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mutalik et al (or hereinafter "Mutalik") (US 6360330) in view Kodama et al (or hereinafter "Kodama") (US 6542962).

As to claim 7, Mutalik discloses the subject matter in claim 1, except the claimed limitation "wherein in issuing one or more of the operating system I/O operations, any error processing associated with issuing the I/O operations is performed by the operating system". Kodama teaches that a server processor 12 will get its first indication of a problem with its allocated disk storage when, at step 90, and error message from the file system, indicating that an error has been received in connection with an I/O read request. The error message will further indicate that the allocated disk storage unit 20 has failed. If such as an error is received, the receiving server processor 12 will send an failover message to Mount Manager 20. The above information shows that an error processing

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associated with an I/O request is performed by the processor, which is represented as the operating system (col. 8, lines 17-25).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Kodama's teaching of processing received error message in connection with an I/O read request by a server processor to Mutalik's system in order to reduce minimum conflict to other read and/or write operations conducted at or about the same time by other processor units (col. 2, lines 12-14).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure

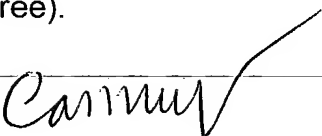
Nolan et al (US 6640278) discloses a storage domain management system supports storage domains. This system includes a plurality of communication interface, adapted for connection via communication media to clients, storage systems and the storage network such as SAN (abstract, col. 2, lines 19-23; col. 4, lines 63-65).

Contact Information

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cam Y T Truong whose telephone number is (571) 272-4042. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Cam-Y Truong
Patent Examiner
Art Unit 2162
10/4/04